

# EDITORIAL COMMENT

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## FRAILITY – A prognosis index turned to a healthcare planner feature for vascular surgery and carotid revascularization

As the life expectancy continually rises among worldwide population, the prevalence of elderly people has tuned the highest in human history. In fact, the number of individuals ageing 60 years old will keep increasing and will double by 2050, reaching near 2.1 billion of worldwide population (from 12 to 22%)<sup>1</sup>. Frailty has then become a major of concern since elderly people are more prone to be “frail” and, subsequently, associated to worse outcomes. Frailty, traditionally defined as an age-related multi-system decline leaves patients vulnerable to stressors such as illness, trauma or surgery. Some surgical specialties have identified that the presence of frailty is associated with inferior clinical outcomes for example, patients with frailty undergoing carotid endarterectomy (or any other vascular procedure) had a worse short and long-term outcomes and a longer length of stay<sup>2-7</sup>.

In fact, for surgeons, several concerns arise once a patient has to be submitted to any elective or emergent surgical intervention, such as the clinical background of the patient and patient’s prognosis, whether going through

a surgical or conservative approach. Regarding vascular setting, patients are getting older and therefore, their characteristics and increasing cumulative comorbidities cannot be ignored. Patients’ profiles that seem to be more prone to “frail” include female sex, low body max index and increased age 5. The presence of cerebrovascular disease and chronic respiratory diseases in patient’s history were the only comorbidities associated to frailty in a recent meta-analysis<sup>5</sup>. Despite these results, actual studies concerning this topic are very heterogenous and the majority are retrospective.

The most recent frailty indexes present a broader scope of frailty, including cognitive, social, and psychological components, next to the physical characteristics<sup>8,9</sup>.

Regarding this matter, a most recent systematic review, where eight different frailty assessments were analysed, has demonstrated a more than four-fold increased risk of mortality in frail vascular patients after 1 and 5 years of surgery<sup>10</sup>. The Risk Analysis Index has been

recommended as a tool to be used in the preoperative decision-making for patients undergoing carotid endarterectomy, for a long-term survival perspective<sup>11</sup>. In frailty assessment, meta-analysis has suggested that tools such as Clinical Frailty Scale, Edmonton Frail Scale and Fried Criteria, that well-validated and reliable, should be preferred in surgical setting<sup>5</sup>. Another key component of frailty is sarcopenia - skeletal muscle dysfunction that develops over a period of time and typically affects older patients leading to reduced strength and muscle mass. Some evidence exists that sarcopenia alone leads to worse survival following endovascular surgery and following elective joint replacement. The social dimensions of the patient have also been included in the recent index since they are a cornerstone of treatment, especially in complex patients with long recovery times<sup>12</sup>.

At short-term postoperative, frail patients are in more risk of developing cardiac complications, reaching an eight-fold increased risk. Likewise, these patients were demonstrated to be significant associated to any of the following comorbidities, such as stroke, renal failure, graft failure, neurologic, respiratory or gastrointestinal complications<sup>10</sup>. Most of the work to date in vascular surgery has focussed on cardiometabolic comorbidities, and there is a need to examine the impact of multimorbidity including conditions that outwit the central cardiovascular system<sup>13</sup>. Concerning patients undergoing carotid endarterectomy, very frail patients have been associated to more than 2-fold increased risk of 3 years postoperative death<sup>14</sup>.

As clinicians, here comes to the true clinical relevance, converting what the practitioners called "instinct" or "this patient will not go well" to measurable science. The capability of stratifying patients revealing their risk-to-benefit scenario of a determined treatment may be of value in regards of prevention and prediction of adverse outcomes. For instance, health professionals may be able to plan in advance and optimize or even revert preoperative conditions of patients, such as physiologic parameters, nutrition or pharmacology, which was demonstrated to improve the clinical prognosis of frail patients<sup>10</sup>. In addition, novel programs including some type of social support, such as buddy system, were built bringing new potential to enhance participation and adherence, through building, maintaining and strengthening social networks. These approaches might play a supportive role in regards of behavioural improvement<sup>15</sup>.

Nonetheless, the previous above-mentioned frailty tool should be validated for each pathology, once included samples amongst studies are heterogenous and an improved quality of study's designs is strongly encouraged.

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